5. Further experience will doubtless render necessary a revision of this Manual. All officers concerned with such work are requested to forward to the Chief Engineer Public Works Department notes of errors found or improvements suggested. Amendment slips will be issued from time to time ; these should be pasted in their proper place, and a note of them made in the form provided for the purpose.

CHAPTER II

Administration and Control

Administrative and financial control

1. The chief administrative control will rest with the Government in Public Works Department. This control will be exercised through the Superintending Engineer, where the work is carried out by the Public Works Department, and in other cases through the Collector. The financial control will be exercised by the Superintending Engineers.

Technical control

2. The chief technical control will be exercised by the Chief Conservator of Forests through whom all technical questions which require the orders of Government should be referred. Working plans must be submitted for approval to the Conservators of Circles who will advise officers on technical matters when required.

Executive control.

3. Executive control will be exercised by (1) the District Local Board or (2) Municipal Boroughs or (3) the Public Works Department. Arboricultural operations on roads and canals maintained by the Public Works Department will be carried out by the Executive Engineer of the Division. Operations on roads maintained by the District Local Board or a Municipal Borough will be carried out by the agency which maintains the road.

4. The working of each of the agencies named will now be discussed separately as far as practically convenient, but, where the remarks or instructions affect more than one agency, they will be found under that agency with which their connection is most important.

District Local Boards

5. It will probably be found that the allotments made for arboriculture by the different Boards are very unequal in proportion to their income. It appears desirable that, without insisting on too rigid a uniformity among bodies which are independent, some reasonable approximation to a general standard of allotment should be attained, but the more arid districts would seem bound to make larger appropriations in proportion to their income than those having a heavier rainfall, as, besides the greater difficulty in securing good results, the shade and vegetation obtained are in themselves more precious; and this appears feasible because such districts have generally to spend less on the repairs of their roads.

Nurseries

6. The foundation of district arboriculture is a sufficient number of well-stocked nurseries. There is a great risk of waste of money in organizing planting operations without a full supply of young plants. Trees are seldom ready to plant out until they are two years old. None should be planted out under 3 feet high. Nurseries should ordinarily be established along roads at suitable distances. Experience shows that nurseries are not usually provided in sufficient abundance, and the District Local Boards should take intelligent and provident action in the matter of providing nurseries. They should be near to the projected work and as numerous as circumstances may require. They will often be made on hired land, when they will be given up after the planting operations are completed. For such nurseries good soil and the existence of a well or other means of watering the plants are the first consideration.

Avenues

7. It will be found that, in most districts, the planting of avenues has been conducted on the sensible plan of working outwards from the head-quarter station. This arrangement probably

affords shade to the maximum number of travellers ; it serves to indicate the order in which the work should be undertaken and it should be followed in every taluka. But the effectual protection of the young trees already put up is of greater importance than new work, which should never be allowed to extend beyond the limit within which efficient protection can be guaranteed.

Staff

8. The staff employed will be of two kinds—Supervising and Executive. The former will be generally from the engineering staff and the latter will consist of those employed in the nurseries and in planting and maintaining the trees at the roadside. It must be realized that the work of growing trees for avenues is distinct from forestry and agriculture, in both of which natural selection by competition is more or less advantageous and economical. The establishment of trees at the roadside is necessarily a costly operation, and each tree in the nursery, which is intended to be planted at the roadside, must be so carefully tended that the period of maintenance, and the number of casualties, at the roadside shall be reduced to the minimum. The work to be done at the nurseries and on the roadside, is not such as can be done by an untrained cooly or cultivator, and it is essential that an ample staff of competent malis shall be employed, especially in the nurseries. There should be at least one capable mali at each head-quarters nursery. If a sufficient number of competent malis cannot be obtained it will be the first duty of this mali to select and train coolies or cultivators. Some of these coolies may be found competent later to take charge of the roadside nurseries, but it cannot be too strongly urged that efficiency and economy in roadside tree planting is chiefly dependent on the competence of the Executive staff. Good malis are not easily obtained and are worth paying well. Certificates are usually of little value and a practical trial is essential. The money needed for obtaining a capable Executive staff and retaining them afterwards should not be grudged.

9. The same trained staff is required for planting the avenues at the roadside and this operation should be considered as part of the work of the nursery. When the trees are planted the work to be done will consist of watering and protecting them. Both must be carefully and systematically done. The bhistis or

other engaged in watering must be trained and their work inspected frequently until they can be trusted. It is important that the same person should be responsible both for watering and protecting the trees. Also the men employed in pruning and lopping must be specially trained. If it cannot be done properly it is better that it should not be done at all.

10. The importance of employing efficient and capable staff for the sake of economy has been strongly urged, and the same principle applies to the provision of the implements required, such as spuds, hoes, knives, secateurs, hose, watering pots, etc. Money spent in providing the stock required of these will not be wasted if the malis are made to use them. Every year the Department of Parks and Gardens conducts a Bagwan (malis) class at the Government Public Park (Poona University) at Ganeshkhind (Poona) which gives comprehensive training to malis especially in ornamental horticulture and arboriculture. Some intelligent members of the executive personnel may be sent there for a three months' short course in Arboriculture.

Working plans and maps

11. Great importance is attached to well-considered plans of operations extending over several years as, without them, there can be no sustained progress. The preparation of working plans will be described and a form given later. If possible this form should be adhered to but, if this is not practicable, any simple plan will suffice which shows clearly the expenditure necessary, for each portion of the work taken in hand, year by year, from the time that the nursery is formed to the time that the avenue needs no further protection. For the preparation of the working plan it is very advisable to have a map showing avenues already in existence indicating the numbered trees, with gaps noted, avenues still under protection and the portions of road proposed to be taken in hand.

Reports and returns

12. Every five years the Local Board shall prepare a concise report showing the progress made and work done on roads which have been permanently constructed and are being maintained. The report should show for each road the condition of the road in respect to roadside trees in the beginning of the period under report, the progress made in filling gaps, in

maintaining recently planted avenues, and in extending avenues to stretches of road not before planted. Statistics should be given of the trees planted out, the survivals and the losses, the income and the expenditure, and the condition of the nurseries keep Government fully informed of the progress made. (if these are used), together with all information required to These statistics may be entered as far as possible in the prescribed forms. They will be submitted to the Collector who will transmit them with remarks to the Superintending Engineer. The Superintending Engineers will consolidate the reports for their Circles and forward them to the Chief Engineer Public Works Department. The Chief Engineer will prepare a consolidated report for the whole Province.

Municipal Boroughs

Scope of operation

13. The above instructions and remarks apply *mutatis mutandis* to all Municipalities though the scope of their work is smaller than that of most District Boards. Ornamental gardens and public parks will be more prominent features in their arboriculture ; but it is important that their attention should be directed to avenues and nurseries, and there is certainly room in most towns for development in this direction. It is true that the minor towns have frequently but a small margin of income available for arboriculture, and in many Municipalities there may be no need for a working plan, but where circumstances render the provision of roadside trees in Municipal limits a suitable and practicable object the Municipal bodies should be moved to prepare plans in accordance with the foregoing instructions so far as they are applicable. Where arboricultural operations are found possible the reports and returns will be submitted as laid dowr for District Boards.

Public Works Department

14. The above instructions apply, *mutatis mutandis,* to the work of the Public Works Department. The staff of the Department will be available for supervision. The reports and returns in appropriate forms, *vide* appendices C andD, will be submitted to the Superintending Engineers who will consolidate them for their circle and forward them to the Chief Engineer Public Works Department.